

clarion Service Manual

Published by Service Administration Section

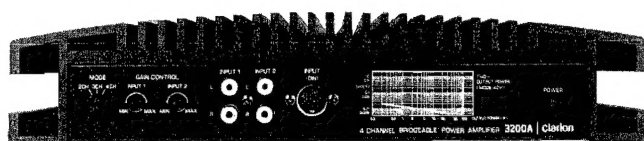


PHOTO: 3200A

- for NORTH AMERICA
4Channel Bridgeable
Power Amplifier

Model **3200A**(EE-724A)

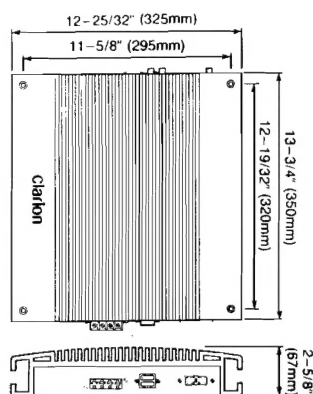
- for EUROPE
4 Channel Bridgeable
Power Amplifier

Model **1004HA**(EE-724B)

■ SPECIFICATIONS:

• 3200A

Continuous Average Power Output: 80W × 4 into 4 ohms.
20 Hz to 20 kHz at 0.1% THD
Frequency Response: 10 Hz to 60 kHz (−1 dB)
Signal to Noise Ratio: 100 dB
Input Sensitivity (for rated output): 0.2 to 2 V Adjustable
Input Impedance: 47k ohms
Voltage: 14.4 V (10.8 V to 15.6 V Allowable)
Current Consumption: 53 Amps at Full Output
Weight: 16.11 lbs (7.3 kg)
Dimensions:



■ COMPONENTS:

• 3200A (EE-724A-01)

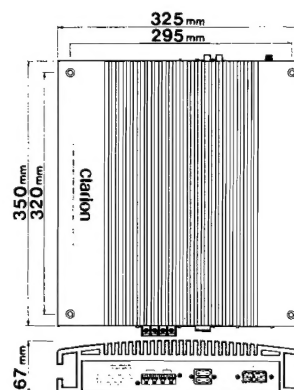
Main unit	1
Tap-screw (M5 × 30)	4
Plate nut	4
Lead holder	4
Battery cord	1
Ground cord	1
9P connector	1

• 1004HA

Circuit System:

High Stability Pulse Width Modulated DC to DC Switching Mode Power Supply + 4 Power units Parallel push-pull complementary circuit.

Rated Power: 80 W × 4 (1 kHz, 0.1% 4 Ω)
Max. Power: 140 W (PEAK) × 4
Frequency Response: 10 Hz to 60 kHz (−1 dB)
Speaker Impedance: 4 Ω × 4
Rated Voltage: 14.4 V (10.8 to 15.6 V) with negative ground
Current Consumption: 53 A (at Full Output)
Weight: 7.3 kg
Dimensions:



■ COMPONENTS:

• 1004HA (EE-724B-01)

Main unit	1
Tap-screw (M5 × 30)	4
Plate nut	4
Lead holder	4
Battery cord	1
Ground cord	1
9P connector	1

■ FEATURES:

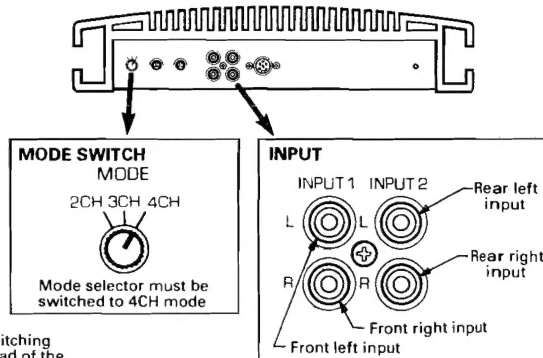
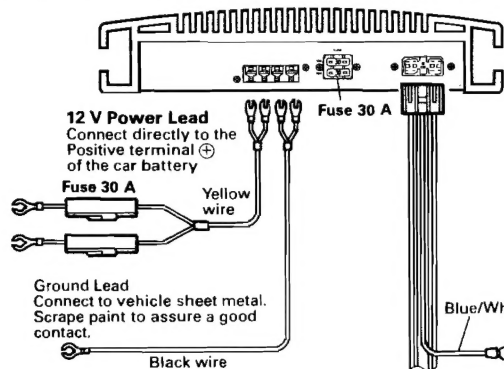
- Total Maximum Power Output 140 W (PEAK)×4
- MAX. Power Output 100 W×4 (at 1 kHz, 10% THD)
- Continuous Power Output 320 W (80 W×4, into 4 Ohms, 20 Hz to 20 kHz, at 0.1% THD)
- Bridgeable for 2, 3 or 4 channel mode operation
- High Stability Pulse Width Modulated DC to DC Switching Mode Power Supply
- Ground-Loop Isolation Input Circuit

- 2 Ohms Load Capability
- Two Adjustable Input Level Controls
- Overvoltage Protection Circuit
- Overheating Protection Circuit
- Speaker Lead Short Protection Circuit
- Turn-On Muting Circuit (Soft Start)
- Low AM Radio Frequency Interference
- Power-On LED

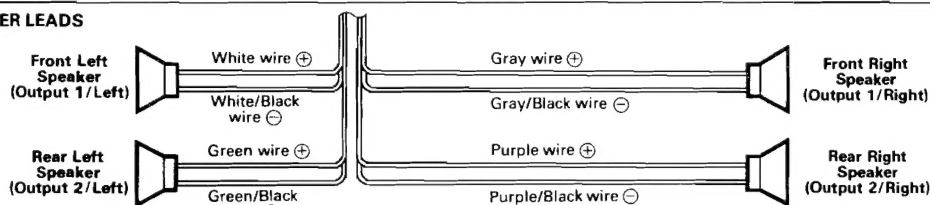
• 3200A

■ WIRE CONNECTION:

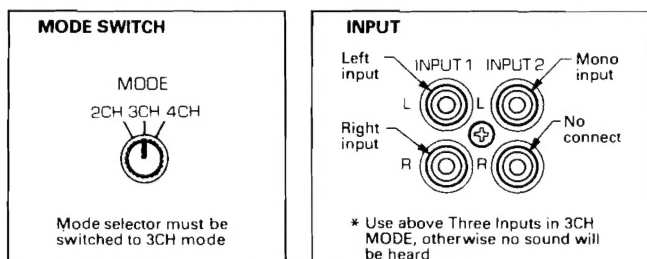
4-SPEAKER INSTALLATION POWER/GROUND/SWITCHING LEADS



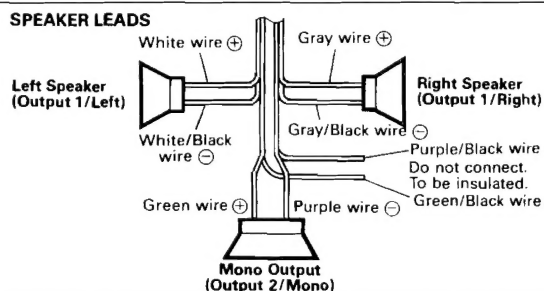
SPEAKER LEADS



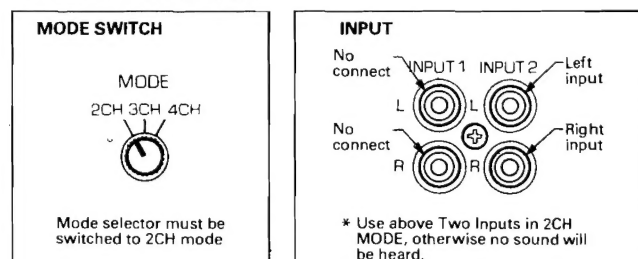
3-SPEAKER INSTALLATION



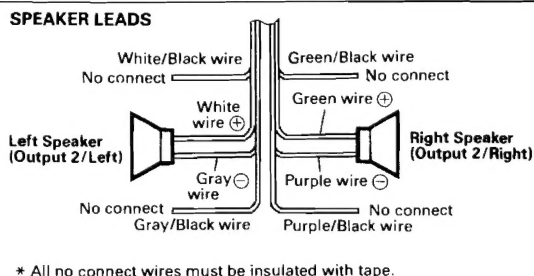
SPEAKER LEADS



2-SPEAKER INSTALLATION

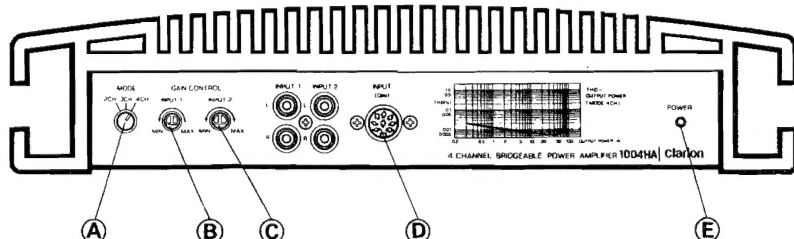


SPEAKER LEADS



• 1004HA

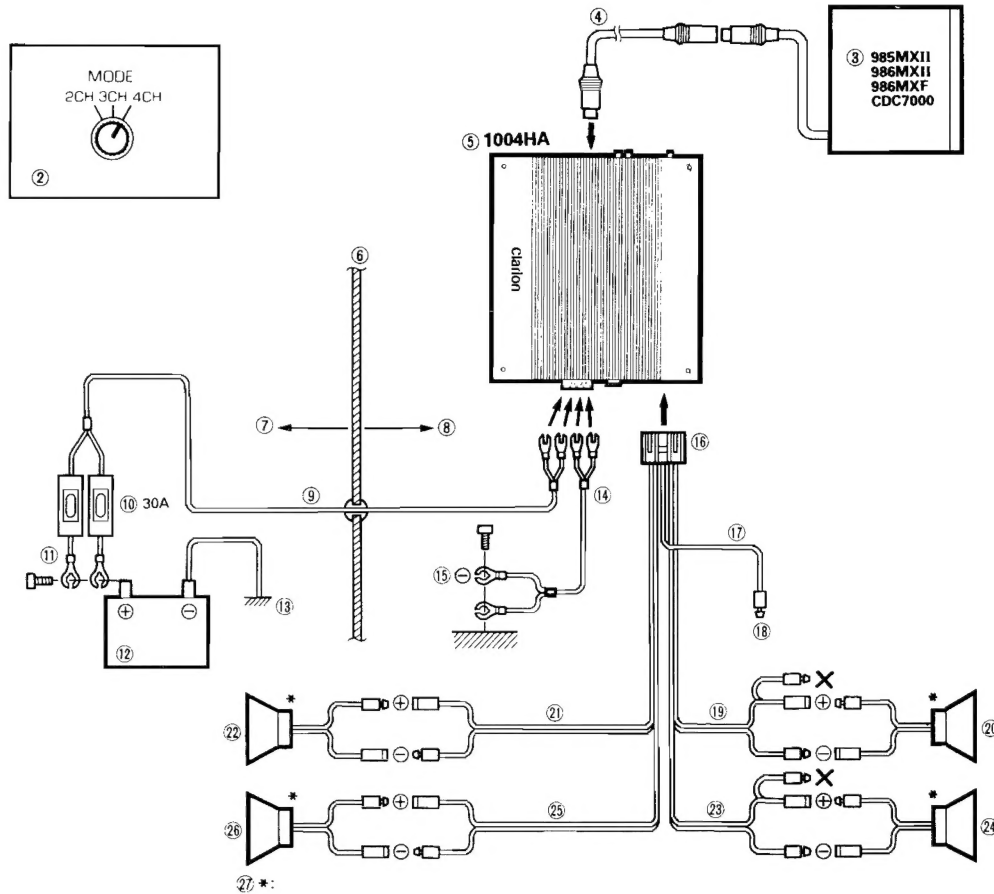
■ OPERATION:



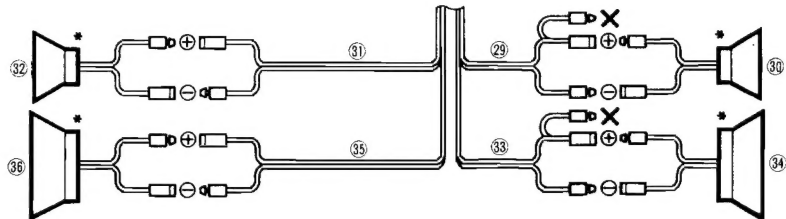
- A **MODE SELECTOR:** Set the mode selector to the desired mode.
- B **INPUT 1 LEVEL CONTROL:** This adjusts the input level of the speakers connected to the OUTPUT 1 jacks when the mode selector is set at the 4CH or 3CH mode.
- C **INPUT 2 LEVEL CONTROL:** This adjusts the input level of the speakers connected to the OUTPUT 2 jacks when the mode selector is set at the 4CH, 3CH or 2CH mode.
- D **DIN INPUT**
- E **POWER INDICATOR**

■ WIRE CONNECTION:

■ 4-SPEAKER INSTALLATION POWER/GROUND LEADS



- 28
- SPEAKER CONNECTIONS WHEN USING WITH THE 20EX ELECTRONIC CROSSOVER OR 900EX ELECTRONIC EQUALIZER WITH SURROUND



1 ■ 4-SPEAKER INSTALLATION POWER/GROUND LEADS

2 MODE Selector

The Mode selector must be switched to 4CH mode.

3 Model with Line Out or 985MXII, 986MXII, 986MXF or CDC7000

4 Connecting Cord. CCA-169-100 or CCA-170-100

5 4 Channel Bridgeable Power Amplifier 1004HA

6 Dashboard (metal sheet)

7 Engine side

8 Internal side

9 Red wire

10 Fuse(30 A)

11 Main Power Supply

12 12V Battery

13 Car Ground

14 Black wire

15 Ground (Connect to vehicle's metal chassis)

16 9P Connector

17 Blue/White wire

18 Amplifier Control Lead

Connect to terminal of the Remote Switching Lead of the head unit.
Amplifier control lead is connected in case RCA Line level input used.

19 +: Gray, -: Gray/Black wire

20 Output 1-Right (Front-Right Speaker)

21 +: White, -: White/Black wire

22 Output 1-Left (Front-Left Speaker)

23 +: Gray/Green, -: Gray/Red

24 Output 2-Right (Rear-Right Speaker)

25 +: White/Green, -: White/Red wire

26 Output 2-Left (Rear-Left Speaker)

27 *: Use 4 ohms impedance speakers with maximum wattage rating of more than 140 watts.

28 • SPEAKER CONNECTIONS WHEN USING WITH THE 20EX ELECTRONIC CROSSOVER OR 900EX ELECTRONIC EQUALIZER WITH SURROUND

29 +: Gray, -: Gray/Black wire

30 Output 1-Right (Mid Range/Tweeter-Right)

31 +: White, -: White/Black wire

32 Output 1-Left (Mid Range/Tweeter-Left)

33 +: Gray/Green, -: Gray/Red

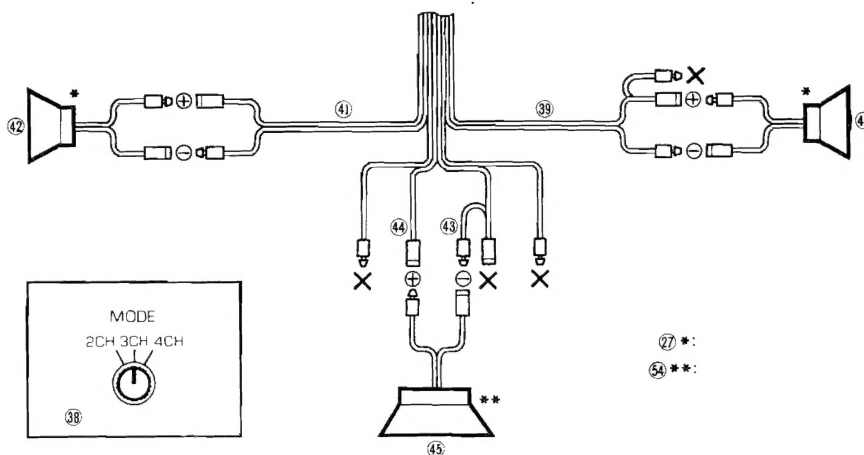
34 Output 2-Right (Woofer - Right)

35 +: White/Green, -: White/Red wire

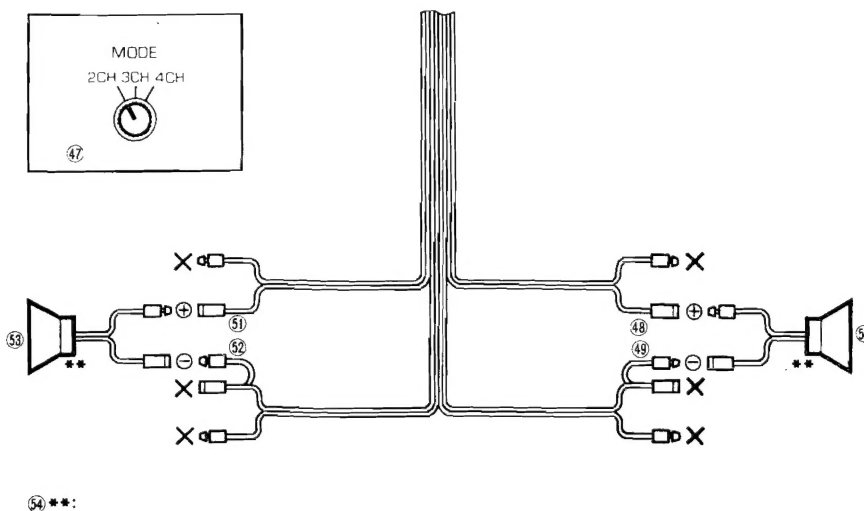
36 Output 2-Left (Woofer - Left)

37 ■ 3-SPEAKER INSTALLATION

(Use these connections when playing the woofer in monaural using in combination with the 20EX Electronic Crossover or 900EX Electronic Equalizer with Surround)



46 ■ 2-SPEAKER INSTALLATION



37 ■ 3-SPEAKER INSTALLATION

(Use these connections when playing the woofer in monaural using in combination with the 20EX Electronic Crossover or 900EX Electronic Equalizer with Surround)

38 MODE SELECTOR

The mode selector must be switched to 3CH mode

39 ⊕: Gray, ⊖: Gray/Black wire

40 **Output 1-Right (Mid Range/Tweeter-Right)**

41 ⊕: White, ⊖: White/Black wire

42 **Output 1-Left (Mid Range/Tweeter-Left)**

43 ⊖: Gray/Green wire

44 ⊕: White/Green wire

45 **Output 2-Mono (Woofer)**

46 ■ 2-SPEAKER INSTALLATION

47 MODE SELECTOR

The mode selector must be switched to 2CH mode

48 ⊕: White/Green wire

49 ⊖: Gray/Green wire

50 **Output 2-Right (Right Speaker)**

51 ⊕: White wire

52 ⊖: Gray wire

53 **Output 2-Left (Left Speaker)**

54 ****:** Use 4 ohms impedance speakers with maximum wattage rating of more than 280 watts

55 Note:

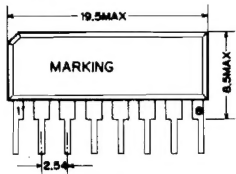
1) The lead wires marked "X" are not used. Make sure that they are not in contact with metal.

2) When not using the DIN cord, input to the RCA terminal. In this case, connect the amplifier control lead (blue/white) in the 9-pin connector to the Remote Switching lead from the unit.

EXPLANATION OF IC's:

μPC1237H 653-0121-14 Power Amp Protector

Outward Form

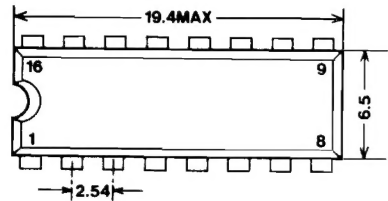


Terminal Connection

Terminal No.	Function
1	Over load detection
2	Central electric potential detection
3	Latch/Auto release selection
4	AC OFF detection
5	GND
6	Relay drive
7	Muting
8	Power supply

μPC494C 653-0121-44 Switching regulator controller

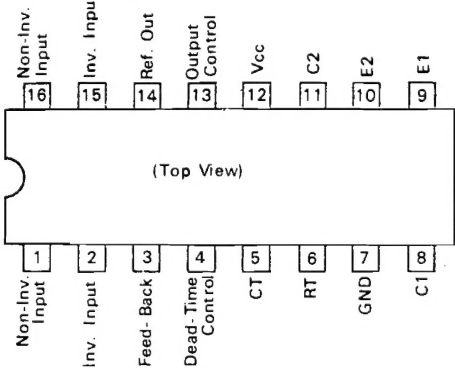
Outward Form



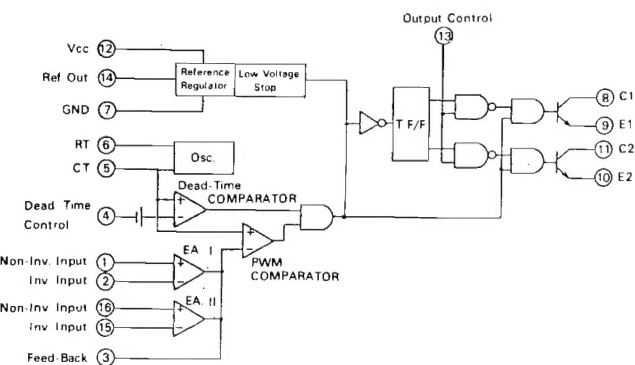
Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply voltage	V _{CC}	41	V
Output voltage	V _{CEA}	41	V
Output current	I _C	250	mA
Power dissipation	P _T	1000	mW

Terminal Connection



Block Diagram

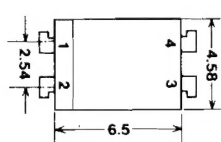


PC817B 653-0121-46 Photo Coupler

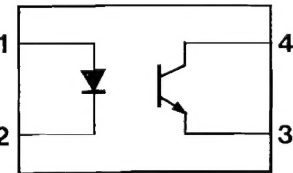
Electric and Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	V _F	I _F =20mA	—	1.2	1.4	V
Peak forward voltage	V _{FM}	I _{FM} =0.5A	—	—	3.0	V
Reverse current	I _R	V _R =4V	—	—	10	μA
Capacitance between terminals	C _T	V=0 f=1kHz	—	30	250	pF
Blind current	I _{CEO}	V _{CE} =20V I _R =0	—	—	100	nA
Photoelectric current	I _C	I _F =5mA V _{CE} =5V	2.5	—	30	mA
Saturation voltage between collector and emitter	V _{CE(sat)}	I _F =20mA I _C =1mA	—	0.1	0.2	V
Insulation resistance	R _{iso}	DC500V 40~60%RH	5×10 ¹⁰	10 ¹¹	—	Ω
Floating capacitance	C _F	V=0 f=1MHz	—	0.6	1.0	pF
Cut off frequency	f _c	V _{CE} =5V I _C =2mA R _L =100Ω	—	80	—	kHz
Response time (Up)	t _r	V _{CE} =2V I _F =2mA R _L =100Ω	—	4	18	μs
Response time (Down)	t _f		—	3	18	μs

Outward Form



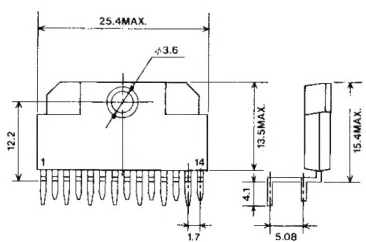
Equivalent Circuit



μPC1298V 653-0126-26 50~80W Power Amp. Driver

This IC is 1-chip monolithic IC up to the drive stage of power transistor from initial stage of power AMP for Hi-Fi.

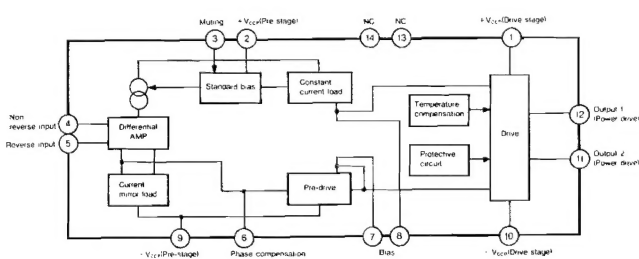
Outward Form



Features

- Low distortion characteristics.
THD=0.002% TYP. (P_o=80W, R_L=8Ω, f=1kHz)
THD=0.007% TYP. (P_o=80W, R_L=8Ω, f=1kHz)
- Wide frequency characteristic as 90kHz can be obtained by the closed loop gain 30dB.
- Driver stage is provided with protective circuit.

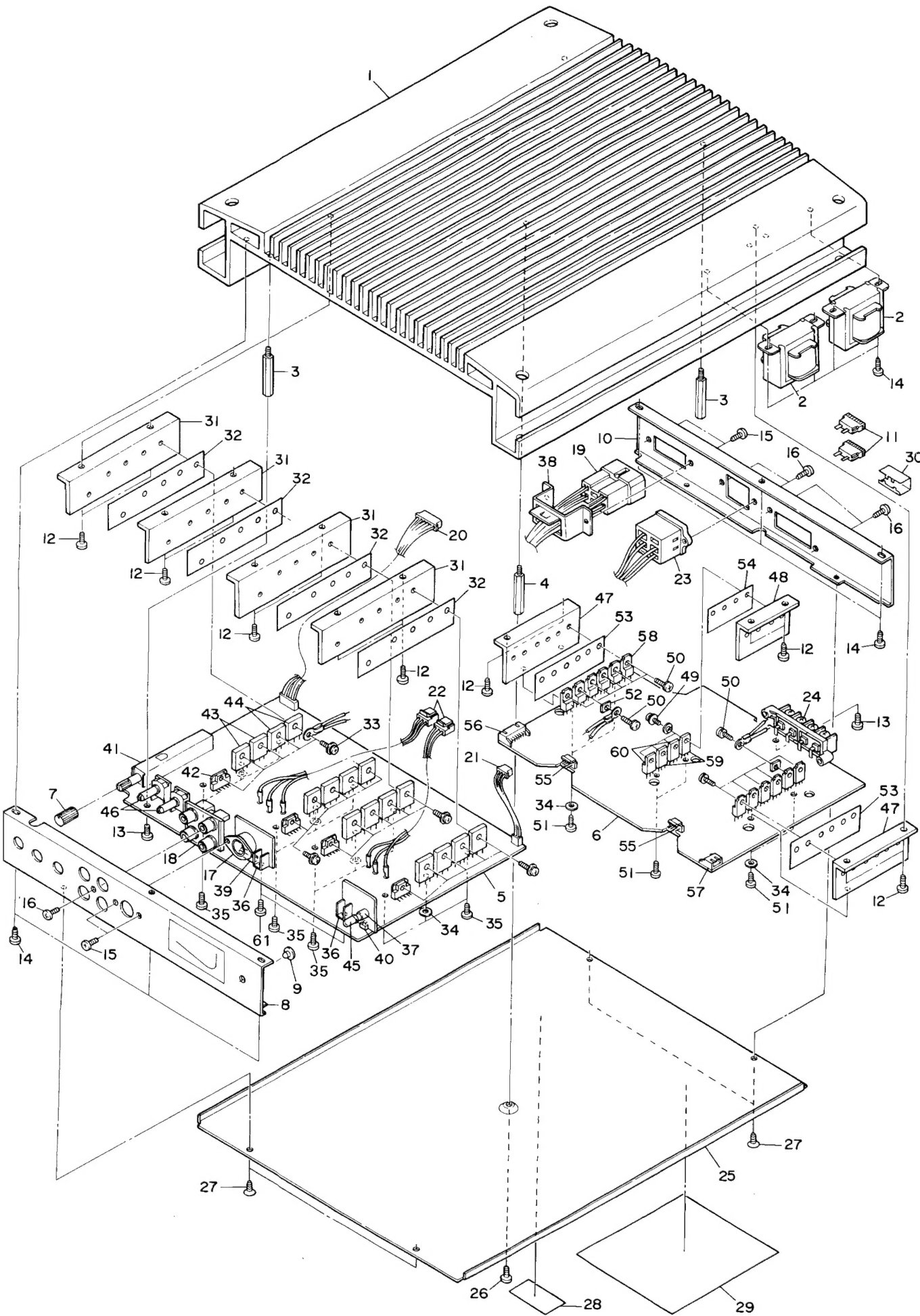
Block Diagram



Terminal Connection

Terminal No.	Terminal connection	Terminal No.	Terminal connection
1	+V _{CCS} (Drive stage power supply)	2	+V _{CCP} (Pre-stage power supply)
3	Muting	4	Non-reverse input
5	Reverse input	6	Phase compensation
7	Bias	8	Bias
9	-V _{CCP} (Pre-stage power supply)	10	-V _{CCS} (Drive stage power supply)
11	Output 2 (lower side)	12	Output 1 (upper side)
13	NC	14	NC

EXPLODED VIEW · PARTS LIST:

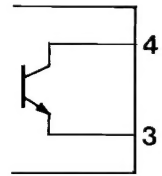


REF NO.
1
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11

EXPLODED VIEW · PARTS LIST:

	Typ.	Max.	Unit
1	1.2	1.4	V
2	—	3.0	V
3	—	10	μA
4	30	250	pF
5	—	100	nA
6	—	30	mA
7	0.1	0.2	V
8	10 ¹¹	—	Ω
9	0.6	1.0	pF
10	80	—	kHz
11	4	18	μS
12	3	18	μS

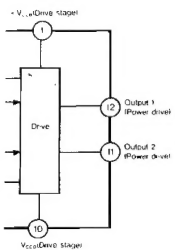
Circuit



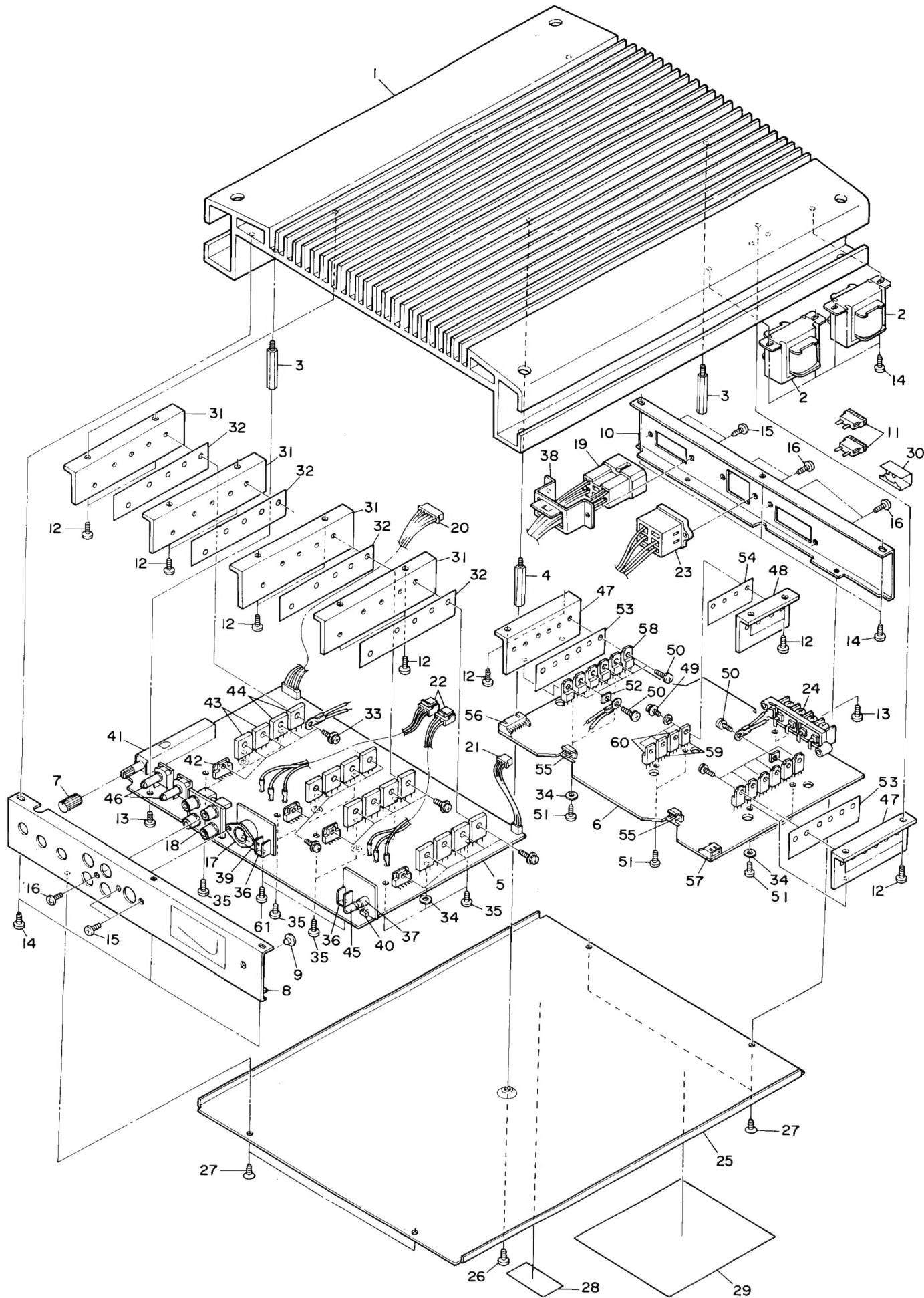
Imp. Driver

transistor from initial

d by the closed loop



connection
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ut
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age power supply)
side)



REF NO.	PART NO.	DESCRIPTION	Q'TY
1	653-0126-01	Main chassis	1
2	653-0121-57	Choke coil	2
3	653-0126-02	PCB support	2
4	653-0126-03	PCB support	1
5	653-0126-04	Power amp. PCB	1
6	653-0126-05	Power supply PCB	1
7	653-0121-56	Switch knob	1
8	653-0126-06 653-0127-01	Front panel (for 3200A) (for 1004HA)	1
9	653-0104-28	LED lens	1
10	653-0126-07 653-0127-02	Rear panel (for 3200A) (for 1004HA)	1
11	060-0057-10	Auto fuse (30A)	2

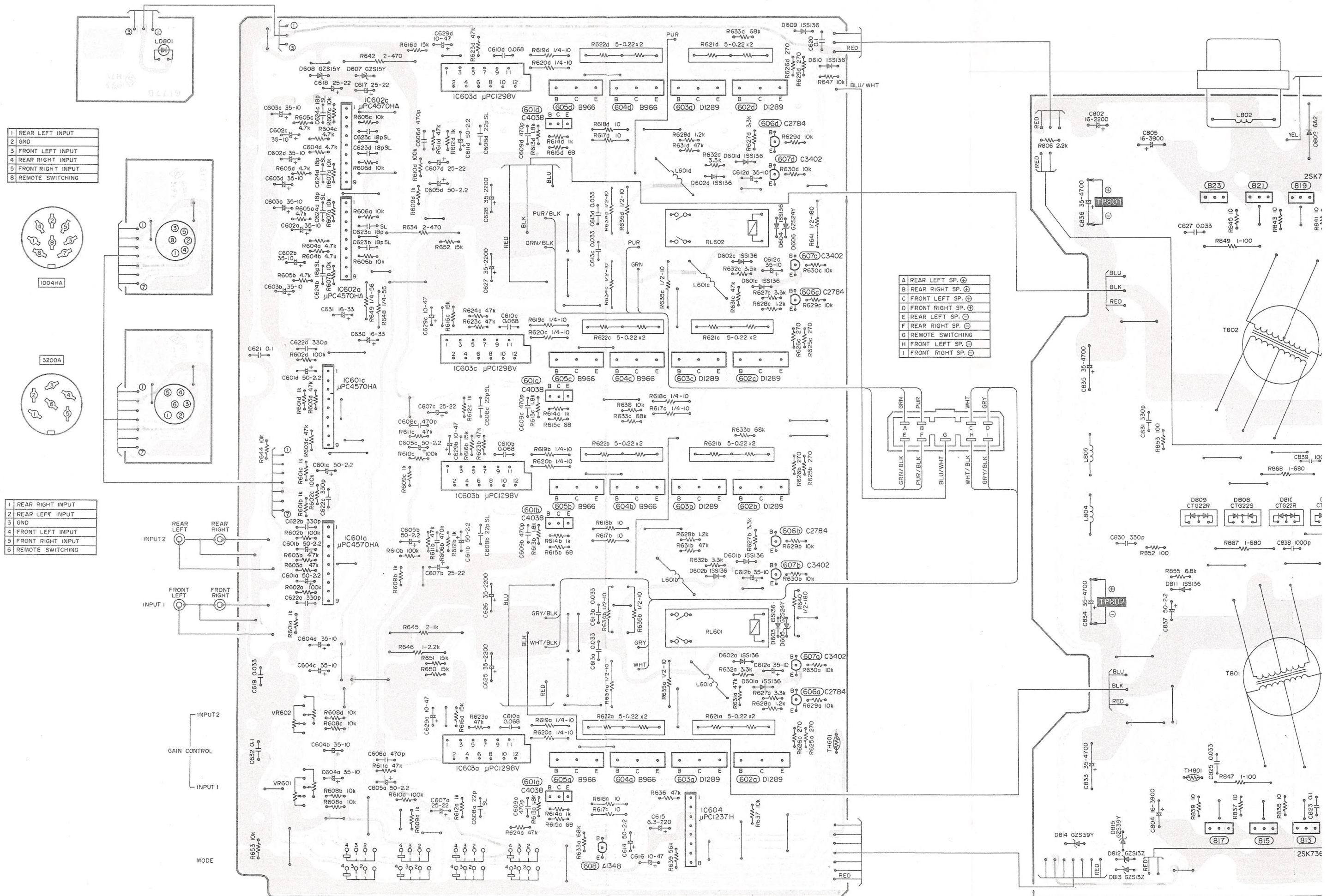
REF NO.	PART NO.	DESCRIPTION	Q'TY
12	702-3008-81	Bind screw (3×8)	14
13	714-3006-11	Pan sems screw (M3×6)	2
14	702-3006-81	Bind screw (3×6)	10
15	653-0121-81	Bind screw (3×6B)	4
16	653-0121-82	Bind screw (3×8B)	5
17	653-0104-12 653-0106-01	DIN jack (6P: 3200A) (8P: 1004HA)	1
18	653-0121-05	RCA pin jack (4P)	1
19	653-0126-08	Cord ass'y (9P)	1
20	653-0126-09	Cord ass'y (7P)	1
21	653-0126-10	Cord ass'y (3P)	1
22	653-0126-11	Cord ass'y (3P)	2
23	653-0126-12	Cord ass'y (FUSE)	1
24	653-0126-13	Terminal (4P)	1
25	653-0126-14	Bottom plate	1
26	653-0121-81	Bind screw (3×6B)	1
27	653-0121-80	Flat screw (3×6B)	4
28	653-0126-15 653-0127-04	Set plate (for 3200A) (for 1004HA)	1
29	653-0126-16	Guide label (use only 3200A)	1
30	653-0126-20	Terminal cover	1
31	653-0126-21	Sub heatsink	4
32	653-0126-23	Cool sheet	4
33	653-0121-77	Plus sems (3×12)	20
34	653-0126-40	Fiber washer	8
35	702-3008-81	Bind screw (3×8)	12
36	653-0121-06	PCB terminal	2
37	653-0126-22	LED spacer	1
38	653-0121-08	Connector bracket	1
39	076-0288-07	7P header	1
40	653-0126-24	3P header	1
41	653-0126-25	Rotary switch	1
42	653-0126-26	IC (μPC1298V)	4
43	653-0126-28	Transistor (2SB966)	8
44	653-0126-27	Transistor (2SD1289)	8
45	653-0104-01	LED (SLP-136B)	1
46	653-0121-25	Variable resistor (50KA×2)	2
47	653-0121-26	Sub heat sink (A)	2
48	653-0126-39	Sub heat sink (B)	1
49	735-3010-11	Pan sems-w (3×10)	4
50	653-0121-78	Pan sems-k (3×10)	12
51	702-3008-81	Bind screw (3×8)	6
52	653-0121-79	Washer	2
53	653-0121-32	Cool sheet (A)	2
54	653-0126-41	Cool sheet (B)	1
55	653-0121-36	Connector (3P)	2
56	653-0126-42	Connector (7P)	1
57	653-0126-43	Connector (3P)	1
58	653-0121-50	FET (2SK736)	12
59	653-0121-41	Diode (CTG22S)	2
60	653-0121-40	Diode (CTG22R)	2
61	714-3006-81	Bind screw (M3×6)	2

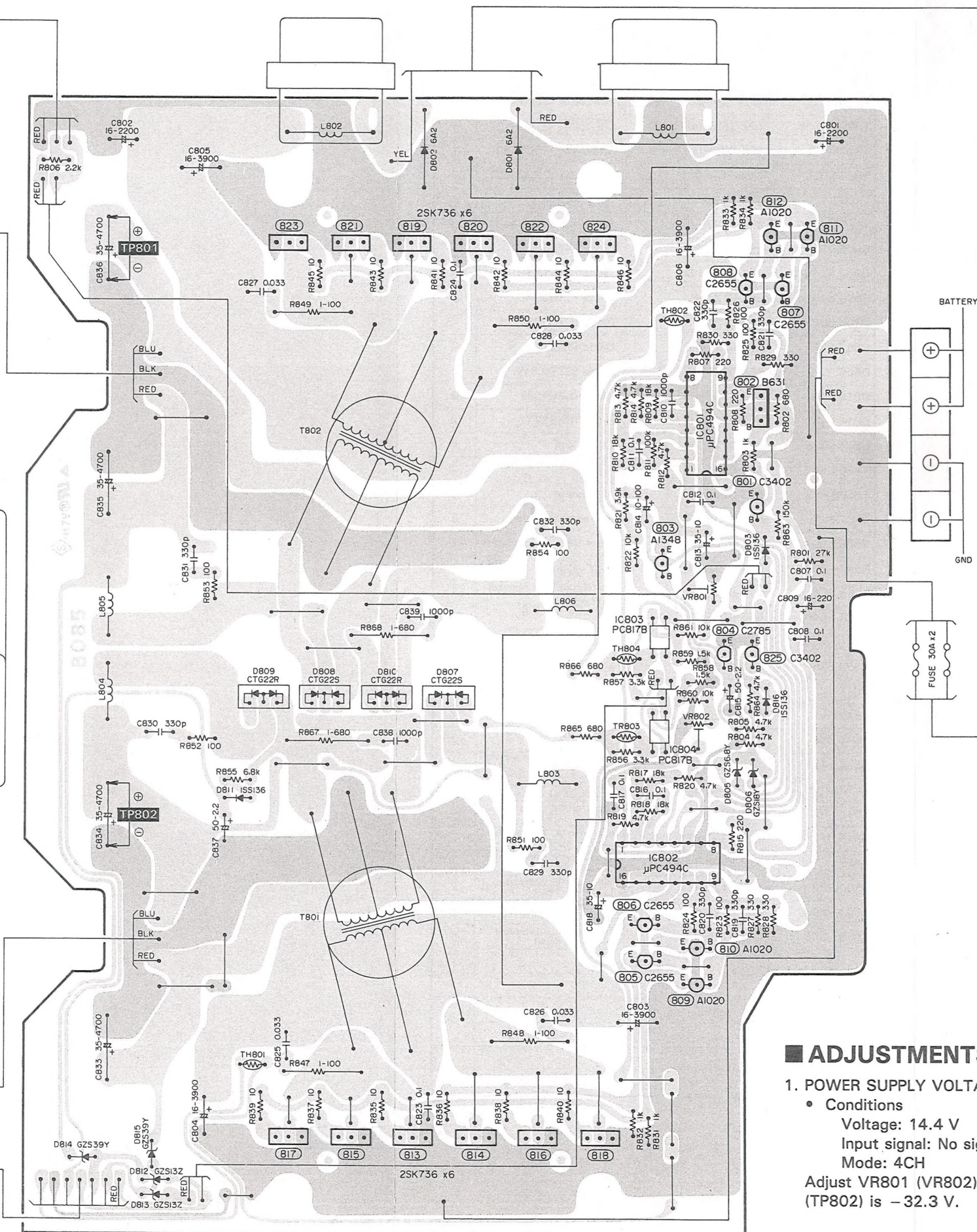
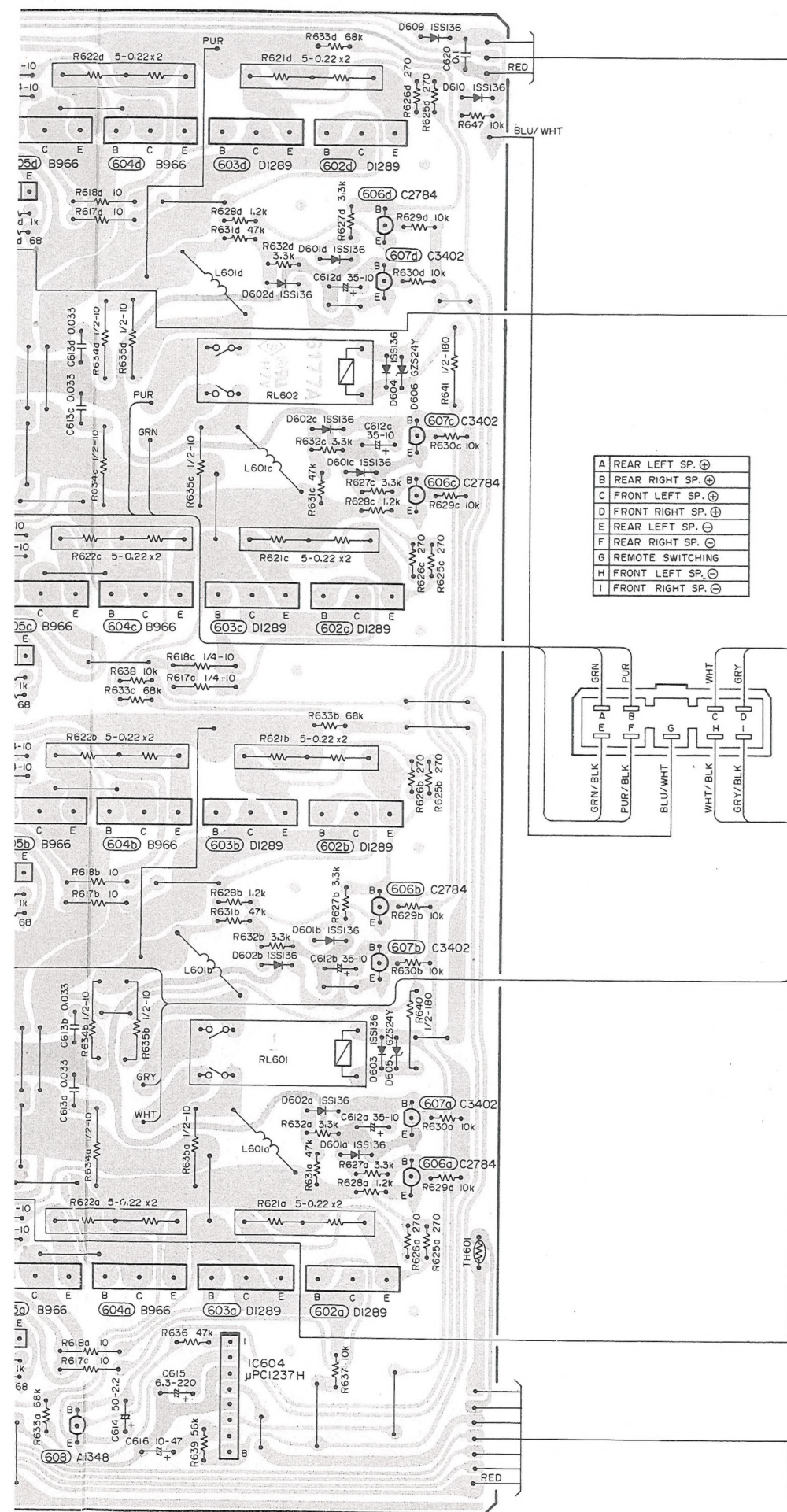
- 1
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■ **PRINTED WIRING BOARD:**





ADJUSTMENTS

1. POWER SUPPLY VOLTAGE:

- Conditions
- Voltage: 14.4 V
- Input signal: No signal
- Mode: 4CH

Adjust VR801 (VR802) so that the voltage of TP801 (TP802) is -32.3 V.

■ PARTS LIST:

◎ Power amp. section

REF NO.	PART NO.	DESCRIPTION	Q'TY
IC601a,c,602a,c	653-0086-58	IC (μ PC4570HA)	4
IC604	653-0121-14	IC (μ PC1237H)	1
IC603a,b,c,d	653-0126-26	IC (μ PC1298V)	4
TR608	100-1348-00	Transistor (2SA1348)	1
TR607a,b,c,d	102-3402-00	Transistor (2SC3402)	4
TR601a,b,c,d	653-0121-71	Transistor (2SC4038)	4
TR602a,b,c,d, 603a,b,c,d	653-0126-27	Transistor (2SD1289P,Q)	8
TR604a,b,c,d, 605a,b,c,d	653-0126-28	Transistor (2SB966P,Q)	8
TR606a,b,c,d	653-0126-29	Transistor (2SC2784E,F)	4
LD801	653-0104-01	LED (SLP-136B-50)	1
D601a,b,c,d, 602a,b,c,d, 603,604,609, 610	653-0104-03	Diode (1SS136)	12
D607,608	653-0121-68	Diode (GZS15Y)	2
D605,606	653-0126-30	Diode (GZS24Y)	2
L601a,b,c,d	653-0121-18	Choke coil (1 μ F)	4
RL601,602	653-0126-31	Relay (G5Z DC24V)	2
TH601	653-0121-22	Posistor (PTHBE)	1
VR601,602	653-0121-25	VR. (50KA*2)	2
C620,621,632	043-0039-20	Ceramic capacitor (0.1 μ F 16V)	3
C622a,b,c,d	160-3312-05	Ceramic capacitor (330pF B K)	4
C606a,b,c,d, 609a,b,c,d	160-4712-05	Ceramic capacitor (470pF B)	8
C613a,b,c,d,619	173-3332-10	Polyester capacitor (0.033 μ F K)	5
C610a,b,c,d	173-6832-10	Polyester capacitor (0.068 μ F K)	4
C623a,b,c,d, 624a,b,c,d	174-1800-43	Ceramic capacitor (18pF SL K)	8
C608a,b,c,d	174-2200-43	Ceramic capacitor (22pF SL)	4
C602a,b,c,d, 603a,b,c,d, 604a,b,c,d, 612a,b,c,d	179-1063-52	Electrolytic capacitor (10 μ F 35V)	16
C601a,b,c,d, 605a,b,c,d, 611b,d,614	179-2253-62	Electrolytic capacitor (2.2 μ F 50V)	11
C607a,b,c,d, 617,618	179-2263-42	Electrolytic capacitor (22 μ F 25V)	6
C630,631	179-3363-32	Electrolytic capacitor (33 μ F 16V)	2
C616,629a,b,c,d	179-4763-22	Electrolytic capacitor (47 μ F 10V)	5
C625~628	653-0126-32	Electrolytic capacitor (2200 μ F 35V)	4
C615	653-0126-33	Electrolytic capacitor (220 μ F 6.3V)	1
R645	114-1021-21	Metal oxidized resistor (1W 2.2K Ω)	1
R646	114-2221-11	Metal oxidized resistor (2W 470 Ω)	1
R642,643	114-4711-21	Metal oxidized resistor (2W 470 Ω)	2
R621a,b,c,d, 622a,b,c,d	653-0121-20	Resistor (5W - 0.22 Ω x 2)	8
R617a,b,d, 618a,b,d	653-0126-34	Fail-safe resistor (1/4W 10 Ω)	6
R634a,b,c,d, 635a,b,c,d	653-0126-35	Fail-safe resistor (1/2W 10 Ω)	8
R640,641	653-0126-36	Fail-safe resistor (1/2W 180 Ω)	2
R617c,618c, 619a,b,c,d, 620a,b,c,d	653-0126-37	Fail-safe resistor (1/4W 10 Ω)	10
R648,649	653-0126-38	Fail-safe resistor (1/4W 56 Ω)	2

◎ Power supply section

REF NO.	PART NO.	DESCRIPTION	Q'TY
IC801,802	653-0121-44	IC (μ PC494C)	2
IC803,804	653-0121-46	IC (PHC PC817B)	2
TR809~812	100-1020-00	Transistor (2SA1020 O,Y)	4
TR803	100-1348-00	Transistor (2SA1348)	1
TR805~808	102-2655-00	Transistor (2SC2655 O,Y)	4
TR804	102-2785-00	Transistor (2SC2785)	1
TR801,825	102-3402-00	Transistor (2SC3402)	2
TR802	653-0121-49	Transistor (2SB631K E,F)	1
TR813~824	653-0121-50	FET (2SK736)	12
D806	653-0104-02	Diode (GZS18Y)	1
DB03,811,816	653-0104-03	Diode (1SS136)	3
D809,810	653-0121-40	Diode (CTG22R)	2
D807,808	653-0121-41	Diode (CTG22S)	2
D801,802	653-0121-42	Diode (6A2)	2
D805	653-0121-74	Diode (GZS6.8Y)	1
D812,813	653-0126-45	Diode (GZS13Z)	2
D814,815	653-0126-46	Diode (GZS39Y)	2
L803~806	653-0121-25	Choke coil	4
TH801,802	653-0121-47	Posistor	2
TH803,804	653-0121-48	Thermistor	2
T801,802	653-0126-47	Power transformer	2
VR801,802	653-0121-28	Semi VR	2
R847~850	114-1011-11	Metal oxidized resistor (1W 100 Ω)	4
R867,868	114-6811-11	Metal oxidized resistor (1W 680 Ω)	2
R835~846	653-0126-37	Fail-safe resistor (1/4W 10 Ω)	12
C807,808,812, 817,823,824	043-0039-20	Ceramic capacitor (0.1 μ F 16V)	6
C838,839	043-0163-00	Polyester capacitor (1000pF 100V)	2
C819~822, 829~832	160-3312-05	Ceramic capacitor (330pF 50V)	8
C810	173-1022-10	Polyester capacitor (1000pF 50V)	1
C811,816	173-1042-10	Polyester capacitor (0.1 μ F 50V)	2
C825~828	173-3332-10	Polyester capacitor (0.033 μ F 50V)	4
C813,818	179-1063-52	Electrolytic capacitor (10 μ F 35V)	2
C814	179-1073-21	Electrolytic capacitor (100 μ F 10V)	1
C815,837	179-2253-62	Electrolytic capacitor (2.2 μ F 50V)	2
C809	179-2273-33	Electrolytic capacitor (220 μ F 16V)	1
C801,802	653-0126-48	Electrolytic capacitor (2200 μ F 16V)	2
C803~806	653-0126-49	Electrolytic capacitor (3900 μ F 16V)	4
C833~836	653-0126-50	Electrolytic capacitor (4700 μ F 35V)	4

